Space Weather Forecast

Issued on Wednesday, 22 May 2024 at 00:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated Moderate-class flares likely throughout. Slight chance G1 Minor Storm day 3-4 (24-25 May) from the arrival of fast winds from a coronal hole.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate-class flare observed from the moderately sized region in the southwest. Growth to the north of its leader spot resulted in a complexification of this region, with some mixing of magnetic polarities also evident in the bipolar pair of spots that form its trailer. The other moderately sized spot, near the south-centre disc, saw some small peripheral spots emerged, but remained stable. There are a total of eight sunspot regions on the disc, all in the southern hemisphere, with no other significant growth observed.

No Earth-directed coronal mass ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds have been indicative of ongoing slow wind conditions. The solar wind speed has been background to slightly elevated, at around 350-450km/s. Interplanetary Magnetic Field (IMF) was weak with the north-south component perhaps slightly favouring a negative (southward) orientation but remaining weak. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained well below S1/Minor Radiation Storm. A very slight increase was seen after a far-sided eruption on 20 May, however this has now eased.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is likely to continue with isolated Moderate flares possible each day, and a slight chance of rising to High due to any Strong-class flares. These most likely from the two larger spots on the disc, one in the southwest and another near the south-centre disc. A returning region is also expected on the northeast by the end of the period. This region was the source of five Strong-class flares as it rotated off the visible disc a couple of weeks ago. It is uncertain how much this region has survived its journey across the far-side however.

Solar Wind / Geomagnetic Activity: There are no Earth directed CMEs. Slightly elevated to background solar winds are expected to persist until day 3-4 (24-25 May), before the onset of fast solar winds from the southward extension of the northern hemisphere coronal hole. The strength and timing of any enhancement is low confidence, however. Mainly Quiet activity is expected with only isolated Unsettled intervals, but likely rising to Active with a slight chance of G1 Minor Storm intervals from any fast solar winds, most likely day 4 (25 May).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background with only a very slight chance of rising to S1/Minor Radiation Storm.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	75	70	60	60
Very Active	R3 to R5 X	No	10	10	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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